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IMPROVING HEAD START TEACHERS' CONCEPT DEVELOPMENT: LONG
TERM FOLLOW-UP OF A TRAINING PROGRAM AND DIFFERENCES IN
PROGRAM IMPACT

A Specialist Project
Presented to
The Faculty of the Department of Psychology
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
Of the Requirements for the Degree
Specialist in Education

By
Amanda Kaitlin Reynolds Lipp

May 2016

IMPROVING HEAD START TEACHERS' CONCEPT DEVELOPMENT: LONG
TERM FOLLOW-UP OF A TRAINING PROGRAM AND DIFFERENCES IN
PROGRAM IMPACT

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Children from a low socioeconomic status (SES) home environment are typically exposed to less vocabulary during the first few years of life and experience higher rates of poor school readiness, particularly in emergent literacy skills, when compared to middle-class peers (Bowey, 1995; Hart & Risley, 2003; Whitehurst, 1997). Early childhood education programs designed to expose this group to cognitively challenging utterances have found that low SES children tend to make greater gains in vocabulary development compared to middle-class peers (Justice, Meier, & Walpole, 2005).

The purpose of this study was to examine the long-term impact of a training program designed to increase the frequency of cognitively challenging utterances in preschool teachers during book reading, and examine the variability in teacher performance for two teachers who had the highest and lowest frequency of cognitively challenging utterances at pretest. Nine female teachers from a Head Start program participated in the training program. Results of the study indicated that, in the long-term, improvements in cognitively challenging utterances and other teacher language variables decreased without follow-up training within a couple of months. After a follow-up training, teachers' frequency of cognitively challenging utterances, word count, and unique words spoken improved, though not significantly. Results indicated that initially higher performing teachers at pretest made greater gains across filmed reading sessions.

Introduction

An important and necessary aspect of development is the acquisition of expressive and receptive oral language skills. These skills are necessary for the conveyance and understanding of ideas from one person to another. Research suggests that vocabulary acquisition, a significant component of oral language skills, is linked to academic achievement (Dickinson & Porsche, 2011). Children require an environment that fosters the development of language skills (Hart & Risley, 1995). As research has found that children from low socioeconomic (SES) backgrounds fail to acquire novel vocabulary at the rate of their middle class peers, there has been a focus on the enhancement of the educational environment to ameliorate the difference in vocabulary acquisition rate (Hart & Risley, 1995). A new professional development program was created by the researchers for this study in order to increase the frequency of preschool teachers' cognitively challenging utterances during story book reading. The purpose of this study was to evaluate the effectiveness of this new program by evaluating the changes in the cognitive complexity of teacher utterances during storybook reading.

Rogoff (1990) stated that by participating in conversation, children are able to infer meaning through novel interactions, allowing them develop linguistically. This builds on Vygotsky's zone of proximal development, which is the space between the developmental level characterized by independent problem solving and potential development when given assistance, or scaffolding, by a more advanced peer or adult (Vygotsky, 1978). Pentimonti and Justice (2010) expressed that scaffolding refers to use of support by educators who initially provide children higher levels of support and gradually decrease support as the child's mastery of the material increases. The zone of

proximal development is applicable to the concept of language development as children are able to expand their vocabulary and oral language abilities through interaction with another person who utilizes more cognitively challenging utterances. Vygotsky (1978) argued that as communication occurs between adults and children, children are able to convert novel language into internal speech, and thereby integrate novel language rules and vocabulary into their own language abilities.

Zimmerman et al. (2009) indicated that the quality and quantity of utterances in a child's language environment, such as having an extended discussion that explores a topic, has a direct impact on language development. In addition, the research of Reese (1995) and Beals, DeTemple, and Dickinson (1994) supports that language interactions with adults, particularly decontextualized speech, promote literacy development.

Decontextualized speech consists of discourse that focuses on a narrative, why and how things work, and events that occur in the past and future (Reese, 1995). Educators, in particular, are able to scaffold a child's language learning by engaging in interactions that are within the child's zone of proximal development (Milburn, Girolametto, Weitzman, & Greenberg, 2014). These interactions between children and those who have more advanced knowledge of vocabulary and the structure of language provide children with the opportunity to gradually assimilate novel vocabulary and language structure into their own repertoires. For preschool educators, the use of certain interactions, such as open- or close-ended questions, provides levels of demand within a child's zone of proximal learning and more likely than not results in a correct response (Milburn et al., 2014). Correct responses provide additional opportunities for positive feedback, which, in turn, can promote student engagement in the material and increase the likelihood of actively

participating in conversations with the educator in the future. Utilizing interactions within the zone of proximal development can promote a child's vocabulary repertoire.

Unfortunately, as Beals et al. (1994) found, home and school environments vary greatly in the frequency of opportunities to engage in these interactions, indicating that a professional development program is necessary for educators to amend this deficiency. Justice, Mashburn, Hamre, and Pianta (2008) argued that preschool environments characterized by a high frequency of cognitively challenging interactions have a direct impact on children with a high risk for future language difficulties, including children of low income by improving vocabulary. Additional research indicates that high-quality preschool environments can potentially mitigate the risks for future school failure for low-income children (Logan, Piasta, Justice, Schatschneider, & Petrill, 2011). Because oral language skills promote precursor reading skills, which are strongly correlated with more advanced word decoding and reading comprehension, it is important to promote oral language skills during earlier years of education (Storch & Whitehurst, 2002). As shared story book reading provides opportunities to engage in interactions necessary for vocabulary development and oral language skills, researchers have focused on this regularly occurring classroom activity to increase teacher use of these interactions.

How a Lower Socioeconomic Status Home Environment Can Negatively Impact School Readiness

Several studies have found that a low socioeconomic status (SES) home environment was significantly related to poor school readiness, particularly in emergent literacy skills, when compared to middle-class peers (Bowey, 1995; Whitehurst, 1997). These underdeveloped skills include phonological awareness, oral language, print

concepts, alphabet knowledge, and reading comprehension (Bowey, 1995; Juel, Griffith, & Gough, 1986; Neuman, 2006; Smith & Dixon, 1995). Given that children who begin school without the necessary language skills are at risk for short-term and long-term negative literacy outcomes, it is important to identify the potential environmental factors that explain why lower SES children lack necessary language skills (Lonigan, Schatschneider, & Westberg, 2008; Wasik, Bond, & Hindman, 2006).

Hart and Risley (1995) found that the vocabulary scores of preschool children were positively correlated with the amount of parental talk to the child in the home environment as well as the length of parental utterances. In addition, 86 to 98% of recorded words by the preschoolers matched the recorded words of their parents, meaning that children's vocabulary reflects the words that their parents use (Hart & Risley, 1995). Therefore, children who were exposed to a greater amount of talk from parents in their first few years of development entered school with better developed language skills that supported literacy development (Hart & Risley, 1995). However, children from low-income households entered school with less developed language skills compared to middle- and upper-class peers as a result of exposure to less talk and fewer unique vocabulary words (Hart & Risley, 1995). In their follow-up research, Hart and Risley (2003) discovered that there was a significant positive correlation between preschoolers' language skills and their reading comprehension, receptive vocabulary, and use of language in the third grade. In addition, Hart and Risley (2003) found that by age three, middle-class SES children were exposed to approximately 30 million more spoken words in their home environments compared to lower-class peers. This supports that the

level of exposure to interactions in the home environment in the early years of development has significant implications for long-term school performance.

If home environmental factors associated with low SES contribute to less developed language and literacy skills, it is logical that by providing an enhanced schooling environment for lower SES students, the performance gap between lower- and middle-class SES students would decrease. Exposure to a varied vocabulary in school is linked to expressive use of the vocabulary words, and the lack of a well-developed vocabulary is linked to problems in reading comprehension in later grades (Chall, 1983; Dickinson, Cote, & Smith, 1993). Therefore, students who are exposed to a varied vocabulary in the school environment are more likely to experience less difficulty with reading comprehension later on. Dickinson and Tabors (2002) stated that preschoolers who are exposed to higher quality preschool programs designed to enhance vocabulary growth may acquire the necessary improvement in vocabulary growth and language learning that will help them develop higher-order literacy skills in later grades. As 47% of lower-income children from ages three to five years are enrolled in childcare, many states have adjusted educational standards to include specific literacy goals for preschool children prior to entering formal schooling (National Center for Educational Statistics, 2007; U.S. Department of Education, 2007).

Given the change in education standards, it is necessary for educational programs, such as preschool programs serving lower-income children, to integrate new instructional practices into their current teaching strategies. As research has found that lower-income children with lower vocabulary levels benefit from interactions that promote language development, instructional practices should focus on promoting interactions that support

vocabulary growth (Dickinson & Porsche, 2011). It is logical that teachers are more easily able to integrate new instructional practices into activities that already occur in the classroom environment. Given this, research has supported the use of shared book reading as an activity in the classroom that can be used to enhance the language development of children of lower income (Milburn et al., 2014).

How Shared Book Reading is Beneficial to Literacy and Vocabulary Development

Research has found that shared reading, particularly in the classroom environment, has profound effects in improving literacy and vocabulary. Not only is the frequency of exposure to shared reading in the classroom related to improvements in vocabulary acquisition, but how teachers read to students is important as well. For instance, Elley (1989) found that although elementary students improved in their acquisition of novel vocabulary words by 15% through exposure in shared reading alone, students who were exposed to both the novel vocabulary words as well as additional extra-textual talk about the vocabulary words had a 40% improvement in vocabulary acquisition. In addition, research has found that at-risk kindergarteners made significantly greater gains in vocabulary acquisition when exposed to shared book reading sessions characterized by elaboration of novel vocabulary words compared to a peer group who experienced the standard kindergarten curriculum (Justice, Meier, & Walpole, 2005). Additionally, the researchers found that kindergarteners with initially low vocabulary scores made the greatest gains compared to their initially high scoring peers. In contrast, Penno, Wilkinson, and Moore (2002) noted that although children of initial higher ability made greater vocabulary gains, the level of exposure and a teacher's own contribution to learning word meaning in the story context was related to enhanced

vocabulary gains across children of all initial abilities. As Justice et al. (2005) utilized ten storybooks across 20 reading sessions, and Penno et al. (2002) used only two storybooks across 6 reading sessions, this would suggest that a greater number of books and a greater frequency of exposure to novel vocabulary is required in order for children with initially lower vocabulary scores to achieve greater levels of improvement compared to initially higher performing peers. Coyne, McCoach, Loftus, Zipoli, and Kapp (2009) found that kindergarteners demonstrated learning of new vocabulary words when the teacher provided multiple opportunities to discuss the vocabulary outside what was read directly from the story compared to when teachers simply introduced the word to the students.

A study by Zucker, Cabell, Justice, Pentimonti, and Kaderavek (2013) determined that the teachers' use of talk on inferential levels before, during, and after shared reading had positive short- and long-term impacts on literacy and language development for below-average preschoolers. They found that both the use of extra-textual talk and frequency of shared reading sessions were positively correlated with the preschoolers' receptive vocabulary growth, and, moreover, that the use of additional talk was positively related to literacy growth in preschool and improved vocabulary skills in kindergarten.

Dickinson and Smith (1994) found that shared book reading sessions characterized by higher proportions of cognitively challenging discourse predicted stronger comprehension and vocabulary skills among preschoolers one year later. In addition, teachers' use of utterances to correct the accuracy of what the children expressed and inferential talk during shared book reading in preschool had beneficial implications for receptive vocabulary skills for students in fourth grade, demonstrating

that preschool shared reading characterized by cognitively challenging speech does have long-term consequences (Dickinson & Porsche, 2011).

Overall, the research indicates that use of shared book reading sessions within preschool classrooms is strongly connected to improved vocabulary and literacy skills of preschoolers, particularly for children who are at-risk for future school failure. The frequency of shared reading and the variety of books used during shared reading are related to greater levels of improvement for this population. Although the research indicates that shared reading activities are connected to improvements in language development, other studies have found that the types of utterances utilized by teachers during shared book reading are also important for enhancing the overall quality of learning. These particular types of utterances, which are discussed in the next section, can lead to greater improvements in vocabulary growth and literacy.

How Particular Kinds of Utterances During Teacher-Child Interaction Can Enhance Language Development

Through social interaction, participants in conversation develop language ability as they must infer meaning from each spoken exchange (Hetherington, Parke, & Schmuckler, 2005). Interactions between two or more people promote the development of language, and this development can be enhanced depending on the strategies employed by one of the speakers to enhance the other speaker's contribution to the conversation (Wells, 1981). Therefore, interactions between teachers and students provide an optimal setting for developing children's vocabulary, and through the use of particular interactions, vocabulary growth can be enhanced. Massey (2004) stated that educators, including those in the preschool classroom, are in an optimal environment to enable

children's participation in conversation by asking questions and responding to the students' utterances. By frequently engaging students in conversation, teachers create a setting for students to process novel vocabulary at a deeper level (Zimmerman et al., 2009).

Research has demonstrated the benefit of utilizing certain interactions in conversation to enhance language development. Justice et al. (2005) found that providing definitions of vocabulary words is related to moderate improvements in children's vocabulary acquisition. In addition, shared book reading is an optimal environment to engage in teacher-student interactions that lead to a greater understanding of novel vocabulary words as books expose students to unfamiliar words (Coyne, Simmons, Kame'enui, & Stoolmiller, 2004). Although students may be able to process and understand unfamiliar vocabulary words through passive exposure, such as experiencing a book read to them, Biemiller and Boote (2006) found that students learn significantly more words when novel vocabulary words are explicitly discussed and defined. Therefore, although students may benefit from simple exposure to text read from a storybook, greater gains in vocabulary can be made if the reader elaborates on the vocabulary presented in the book (Justice et al., 2005).

The use of open-ended questions by a teacher during shared book reading can also enhance language development. Studies have found that the use of open-ended questions is linked to preschoolers' responses that are longer in length and more linguistically complex compared to responses to close-ended questions (Wasik & Bond, 2001; Wasik et al., 2006). In addition, both Wasik and Bond (2001) and Wasik et al. (2006) found that Head Start students and lower income students in other programs who were exposed to

teachers trained to use open-ended questions during shared book reading demonstrated higher receptive and expressive language scores compared to peers who were not exposed to teachers who had received training. These studies suggest the importance of training teachers to utilize open-ended questions when engaging in shared book reading as open-ended questions provide opportunities for children and teachers to engage in cognitively challenging interactions (Massey, Pence, Justice, & Bowles, 2008).

Teachers' responses to children's utterances are related to long-term language outcomes as well as the overall quality of the learning environment (Connor, Son, Hindman, & Morrison, 2005; Girolametto & Weitzman, 2002; Wasik & Bond, 2001). Connor et al. (2005) found that first grade teachers with greater levels of responsiveness to student utterances, particularly in academic subjects, tended to have students with higher level decoding skills and greater vocabularies. In addition, Head Start preschoolers who had teachers who had been trained to be more responsive to child utterances demonstrated higher receptive and expressive language scores compared to peers whose teachers had not received the training (Wasik et al., 2006). Girolametto and Weitzman (2002) also found that a positive relationship between teachers' level of responsiveness and the linguistic complexity of child utterances to teachers.

In addition, Culatta, Blank, and Black (2010) stated that by incorporating content from child utterances into their own responses, teachers can enhance engagement in conversation by allowing the child to influence the direction of the conversation. Increasing teacher responsiveness and promoting student engagement for participating in conversations can lead to a greater likelihood of turn-taking utterances, leading to longer conversations (Girolametto & Weitzman, 2002). Zimmerman et al. (2009) stated that by

encouraging turn-taking and longer conversations, both the student and teacher are able to explore a topic more deeply, which positively affects the child's language development. In addition, when a teacher and child engage a conversation that explores a topic deeply, the utterances from both the teacher and child are more likely to be cognitively challenging, which also enhances language development (Dickinson & Smith, 1994). Overall, a fair amount of studies indicate that using particular types of utterances when interacting with preschoolers has a positive impact on language development.

Given the research, shared book reading that incorporates cognitively challenging talk before, during, and after shared book reading can be an effective classroom activity in improving literacy and vocabulary acquisition for at-risk populations, such as preschoolers in the Head Start program. Not only will a higher frequency of exposure to shared book reading lead to gains, but enhanced teacher-child interactions also can lead to greater improvements in school readiness for lower-income children. Therefore, a professional development program was created in order to increase teachers' use of cognitively challenging speech to support concept formation and vocabulary acquisition during shared book reading.

Why Teachers Would Benefit From a Professional Development Program

The primary goal of the professional development program created for this study was to enhance teacher use of particular utterances and interactions during shared book reading that will ultimately promote low income children's school readiness. Turnbull, Anthony, Justice, and Bowles (2009) have found that teachers provide few opportunities to interact with preschoolers in a manner that is cognitively beneficial to children.

Girolametto, Weitzman, Lefebvre, and Greenberg (2007) found that a vast majority of utterances spoken during shared book reading were low in cognitive demands, requiring little or no response from the child. In addition, researchers using the Classroom Assessment Scoring System (CLASS) to observe preschool classrooms and rate aspects of teacher-student interactions found that interactions involving concept formation, which encompasses integration of ideas, extended discussions, higher order cognitive skills, and creative problem solving, are lacking in preschool classrooms (Early et al., 2005; Pianta, La Paro, & Hamre, 2008). Other reports indicate that rather than initiating interactions that would lead to extended discussions about the book, many teachers ask closed-ended questions that have only one correct answer and require a response no longer than a couple of words, and that many teachers lack the ability to facilitate particular types of beneficial interactions during book reading (Girolametto, Weitzman, van Lieshout, & Duff, 2000; Massey et al., 2008). Girolametto et al. (2000) found that shared book reading was characterized by interactions that served to manage behavior rather than utterances designed to stimulate conversation. Massey et al. (2008) found that although cognitively challenging questions occurred more often in shared book reading than in other classroom activities, a significant majority of teacher utterances during shared book reading were directed to manage behavior or were low in cognitive demands.

Research has found that there is a high variability across teachers in use of extra-textual talk, with some teachers demonstrating significantly higher levels of during shared book reading (Zucker et al., 2013). In a study examining 60 Head Start teachers, Gerde and Powell (2009) found that the number of questions posed by teachers to preschoolers ranged from zero to 62 in a single shared book reading session. As

children's receptive language performance was positively correlated with teachers' use of cognitively challenging utterances, it is important that teachers learn to utilize opportunities to incorporate cognitively challenging utterances into shared book reading time. Other studies have found that there is a high level of variability across teachers regarding cognitively challenging interactions such as utilizing open-ended questions, defining vocabulary words, and building on the responses of students. Turnbull et al. (2009) found that only one-third of utterances spoken by teachers were language-stimulating, suggesting that professional development programs for teachers are necessary in order to increase the frequency of high quality language, particularly for children who are at-risk for future school failure. Given a high variability of teachers' use of extra-textual talk as well as a deficiency of teacher-child instructional support, children who are already at-risk for school failure may be further set back as they also do not encounter the much needed interactions in their home environment (Hart & Risley, 1995).

A few studies have examined the effects of a professional development program on teachers' use of cognitively challenging utterances during shared book reading using an experimental design (Girolametto et al., 2007; Milburn et al., 2014; Wasik et al., 2006). Wasik et al. (2006) found that Head Start teachers who had been trained to encourage book-related conversations, to directly discuss the meaning of new vocabulary words, to ask open-ended questions, and to incorporate open-ended connections between aspects of the book and the child's experiences outside of the book were significantly more likely to utilize these interactions during shared book reading compared to a control group who received no training. In addition, these teachers were more likely to speak

using more words during shared book reading. Although Wasik et al. (2006) did not report the frequency of interactions that involved directly teaching vocabulary, the results of this study indicate that professional development programs do show some benefit in increasing the use of some types of cognitively challenging utterances in Head Start teachers.

Girolametto et al. (2007) found that teachers can significantly improve in the use of particular utterances during book reading following a short duration professional development program. Teachers in the experimental group were exposed to a two-day training that focused on strategies that enhance extra-textual talk during shared book reading. These teachers significantly improved in the use of cognitively enhancing utterances and tended to use more inferential speech compared to a control group who had received no training. Girolametto et al. (2007) demonstrated that professional development training improved the extra-textual talk of teachers during shared book reading.

Finally, Milburn et al. (2014) found that teachers who had received group training about strategies to use during shared book reading as well as individual training sessions used a significantly larger number of unique words, open-ended questions, and extended discussions regarding the books compared to a control group who had received no training. Like Milburn et al. (2014), the current study promotes the utilization of both group and one-on-one trainings in a professional development program designed to enhance usage of particular interactions during shared book reading.

As research indicates teacher-child interactions that emphasize concept formation are lacking in the preschool classroom, and these interactions are imperative for language

development, particularly for children at-risk for future school failure, a professional development program was created to increase these interactions in a local Head Start program. The researchers selected shared book reading to increase these interactions as it is a regularly occurring activity in the classroom and provides ample opportunities to integrate these interactions into typical instructional practices. Teachers were audio and video recorded reading researcher-provided books to a small group of preschoolers four times during the school year. Teachers received training after pretest, and they received a refresher training following the second posttest. Fisher (2015) focused on the short-term change in teacher use of particular interactions through evaluating pretest and posttest performance.

Purpose of the Current Study

The primary goal of the professional development program created for this study was to enhance teacher use of particular utterances and interactions during shared book reading that will ultimately promote low income children's school readiness. This study focuses on the long-term impact of the training sessions by evaluating the change in frequency of interactions of varying cognitive complexity from posttest 1 to posttest 2, as well as from posttest 2 to posttest 3. We hypothesize that the improvements in using cognitively challenging utterances during book reading will not maintain in the long-term. In addition, as the research indicates that teachers demonstrate a large amount of variability in usage of cognitively challenging interactions, this study compares the change in performance across all four filming sessions for two teachers. These two teachers were selected as one demonstrated the highest frequency of cognitively challenging utterances at pretest, and the other demonstrated the lowest frequency of

cognitively challenging utterances at pretest. We hypothesize that the initially higher performing teacher will improve more than the initially lower performing teacher. An analysis compared the rate of improvement in the usage of cognitively challenging utterances between these two teachers.

Method

Participants

Nine teachers (all female) from a combined Head Start and university campus childcare center participated in the study. Of the nine teachers, four were lead teachers, and five were assistant teachers. One lead teacher was unable to participate in the first posttest filming as she was on maternity leave, but did participate in the second and third posttest filmings. Another lead teacher left the center prior to the second posttest filming and therefore did not complete the study. Two assistant teachers began participating in the study during the second posttest session and did not participate in the first training as they did not begin employment until after the first posttest filming. A total of seven teachers participated in the pretest filming, six participated in the first posttest filming, and eight participated in the second and third posttest filming sessions. Seven teachers earned a Bachelor's degree, one had earned an Associate's degree, and one had earned a Master's degree. The average number of years of teaching experiences was 12.7 years. The average age of the teachers was 35.3 years. Six of the teachers were Caucasian, and three of the teachers were African American. A total of five of the teachers participated in the posttest 1, posttest 2, and posttest 3 filmings, and their data will be used in the analyses. Teachers were compensated with the books provided to them for the shared book reading sessions.

Design

A repeated measures design was used to evaluate the change in progress in the use of particular utterances. This study focuses on the effects of a Head Start teacher professional development program on increasing desirable cognitively challenging

utterances during shared book reading with low-income preschoolers at-risk for future school failure. Four filming sessions occurred across the study that audio and video recorded teachers reading researcher-provided books to a small group of preschoolers. The filmings were spaced throughout the school year to evaluate progress. The professional development training sessions occurred after the first and third filming. Additional details about the training sessions are provided later. Fisher (2015) focused on the pretest filming, a training session, and the first posttest filming; in this report, we focus on evaluating the long-term effects of the professional development program, a refresher training, and a final posttest filming. In addition, this report will address the variability in teacher performance across all four filmings by examining the difference in improvement from pretest to posttest 3 between the two teachers with the highest and lowest frequencies of cognitively challenging utterances at pretest.

Procedure and Materials

A Western Kentucky University Institutional Review Board approval was obtained in order to complete the study (see Appendix A). A total of four filmings occurred during this study; Fisher (2015) focused on the pretest filming, a training session, and the first posttest filming. For the pretest and posttest 1 filming sessions, teachers were provided the books *Animals Should Definitely Not Wear Clothing* and *Never Take a Shark to the Dentist (and Other Things Not to Do)* to read to the students (Barrett, 1970, 2008). Half of the teachers read one book and the other half read the other book at pretest; teachers switched books for the posttest 1 filming session. This report focuses on the second posttest filming, a refresher training session, and a third and final posttest filming as well as variability in teacher performance across all four filmings.

Figure 1 outlines the sequence of filming and training sessions that occurred throughout the study.

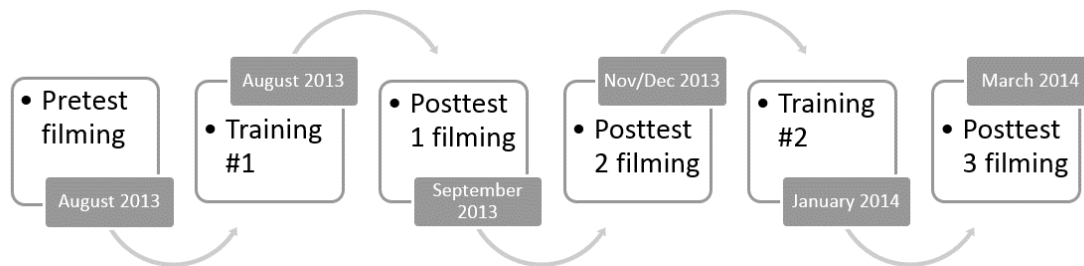


Figure 1. Sequence of filming and training sessions.

The first training session occurred a few days after pretest and a month before the posttest 1 filming and was provided to teachers in a group setting. The training emphasized considerations regarding book selection, preparing to read to children, promoting particular interactions during book reading, and promoting interactions after reading the book. Teachers were provided PowerPoint presentation slides as well as a training handout (see Appendixes B and C).

When considering the selection of a book, teachers were advised to consider their goals in teaching their children. In addition, when introducing new vocabulary, teachers were advised to consider children's experiences, previously taught lessons, and other concepts that are familiar to children. Also, when selecting a book, teachers were told to carefully consider the book topic and format.

When preparing to read a book, training stressed reading and studying the book ahead of time, as well as formulating a statement that introduced students to the topic of the book. Teachers were encouraged to think of possible open-ended questions to ask students that could create opportunities for discussion.

In addition, before teachers read the book to children, they were cautioned to identify vocabulary words that would be unfamiliar to children and thus require developmentally appropriate explanations. If a book was longer in length, teachers were advised to identify key places throughout reading to summarize what has been read so far.

Finally, during the preparation phase, teachers were taught to formulate thought provoking open-ended questions to ask students after the book is read (e.g., Why does the character feel happy?). Training emphasized that when reading to children, teachers need to be engaging by using eye contact, facial expressions, and vocal tone to maintain attention. In addition, teachers were cautioned to provide children enough time to answer questions so that they can think about their answers. When provided an answer, the teacher was instructed to expand on the child's language to encourage language development.

In addition, during book reading, teachers were advised to manage children's behavior by praising children who are paying attention and participating in discussion of the book. After the teacher finished reading the book, teachers were encouraged to ask children for feedback regarding the story and about their favorite parts of the story. The professional development training also advised teachers to share with students their own favorite parts of the story to promote further discussion.

In a second individual training session, teachers observed their pretest videos and were advised by the researcher on how to improve by identifying moments in the pretest filming that provided opportunities to use cognitively challenging utterances. In a third training session, groups of teachers brought books and read to other teachers as if they

were reading to other students. After teachers practiced reading, a feedback and discussion session followed regarding teacher performance and opportunities for future improvement. Feedback was provided by the researcher and other teachers.

After the first training sessions, teachers were filmed a few weeks later to gather posttest 1 data. They were filmed again three months after the first training session. Prior to the second posttest filming, the researchers provided teachers with the books *Harry the Dirty Dog* and *No Roses for Harry* to use during the second and third posttest shared book reading filmings (Zion & Johnson, 1956, 1958). These books were the same length and were selected based on their age appropriateness as well as a high frequency of opportunities to discuss literal and inferential aspects of the story with preschoolers.

Two of the teachers who participated in the second and third posttest filming had not received prior training. For counterbalancing purposes, half of the teachers were instructed to read *Harry the Dirty Dog* during the second posttest filming, and half of the teachers were instructed to read *No Roses for Harry* during the second posttest filming. Teachers then read the other book during the third and final posttest filming.

Filming sessions were scheduled during a period of time in the school day that was convenient for the teacher. This typically was during center time, when the class was divided into smaller groups across different activities. Teachers were provided with a microphone to wear around their neck while they read to enhance the audio recording. Teachers instructed a group of students to join them in an empty area of the classroom so that they could read the children a story. All but two teachers invited approximately 5-6 students to the shared book reading session. The other two teachers read the provided book to the entire class, which was approximately 12-14 students.

Follow-up training occurred in January a month after posttest 2 and 2 months before posttest 3. Unlike the first training session, which included both group-based and individual sessions, the second training consisted of individual sessions only. Teachers were each shown their posttest 1 and 2 videos. Like the first training, teachers were praised for usage of cognitively challenging talk during their posttest 1 and 2 film sessions and were given feedback regarding additional opportunities to integrate cognitively challenging utterances into their book reading. In addition, after viewing her own video, each teacher was shown the posttest 2 performance of a teacher who utilized significantly higher frequencies of cognitively challenging utterances (this teacher gave permission to use her video in this fashion). After the January feedback session, teachers were filmed for their third and final posttest shared book reading session in March. Each teacher read from the book that she had not used during the second posttest filming session.

Each shared book reading session was audio and video recorded during the filmed reading sessions. Two graduate students and one undergraduate student recorded the reading sessions. Then, each session was transcribed word for word by one of the three students; transcribed sessions were checked for accuracy by a different transcriber before coding was done. Each session was coded by one of the three students. Teacher utterances were evaluated on concept development using a coding system similar to that of Dickinson and Smith (1994). This particular coding system (see Table 1) categorized each utterance spoken by the teachers during shared book reading according to when an utterance occurred (before, during, or after book reading), and the type of utterance (cognitively challenging talk, lower cognitively demanding talk, managing interaction, or

other). Cognitively challenging utterances were further categorized as: a) analysis of characters or events, b) prediction of coming events, c) open-ended connections, d) defining or commenting on a vocabulary word, e) summarizing, f) clarifying, g) evaluating, h) thought-provoking questions or suggestions, i) modeling language, or j) extended discussion of five or more exchanges between the teacher and students. Lower cognitively demanding utterances were further categorized as: a) book-focused utterances, b) labeling of objects or actions, c) skill routines which occurred during the reading, d) direct recall of recently read text, e) chiming of familiar passages or of student's speech, f) simple instructions, g) close-ended questions, h) answering own question (often before child has the opportunity to answer), or i) closed-ended connections. Utterances involving managing interactions were further categorized as: a) task organization, b) requests for attention, c) general feedback to speakers, or d) other managing interaction. Utterances that were categorized as other were further categorized as: a) unintelligible speech, or b) not matching one of the other three types of utterances. Table 1 provides additional information about the coding system utilized.

Coders watched the video with the transcript in hand and noted the frequency and rates of cognitively challenging, lower cognitively demanding, and managing interactions utterances. Approximately 25% of the sessions were coded by two coders who were blind as to which sessions were double coded (average Cohen's kappa = .80 - .91).

Table 1

Coding System for Utterances Before, During, and After Shared Book Reading

Category Code	Subcategory Code
CCT (Cognitively Challenging Talk)	CCTANAL- Analysis of characters or events in book (goes beyond mere labeling)
	CCTPRED- Predictions of coming events in book
	CCTCONO- Open-ended connections between text and real life events; can be questions or statements; must be thought provoking and/or promote discussion
	CCTVOC- Vocabulary (definitions, comments about sounds or functions of words)
	CCTSUM- Summarizing book
	CCTCLAR- Clarifying comments about story (explaining something about the story; goes beyond what has already been said)
	CCTEVAL- Evaluative responses to story
	CCTTPR- Thought provoking questions or suggestions (open-ended questions or comments to which there can be a variety of responses)
	CCTML- Modeling language (expanding on child's utterance, rather than simply imitating what the child says, the teacher adds additional words/complexity)
	CCTEXTD- Extended discussion that explores a topic (5 or more turns)
LCD (Lower Cognitively Demanding)	LCDBK- Book-focused utterances (book is treated as an object)
	LCDLAB- Labeling of objects of actions
	LCDSK- Skill routines which occur during reading (e.g., reciting ABCs, counting)
	LCDDR- Direct recall of recently read text or recently given labels of instructions
	LCDCHM- Chiming of familiar passages or of a child's utterance
	LCDSIN- Simple instructions
	LCDCLQ- Closed questions with only one correct answer
	LCDAOQ- Answers own question that was posed to children (usually before children have a chance to answer it themselves)
	LCDCONC- Closed connections (closed question or statement that connects a concept to children's lives but does not encourage thought or discussion)
MI (Managing Interaction)	MITSK- Task organization (where to sit, how to behave)
	MIREQ- Request for attention
	MIGENF- General feedback to speakers (good job, wow, etc.)
Other	OTHERUN- Unintelligible
	OTHER- Not one of 3 major codes

All utterances were also evaluated for the mean length of utterance (MLU). To calculate MLU for all utterances, a graduate student identified the number of morphemes per utterance and averaged the number of morphemes across utterances for each filming. The number of words and number of unique words were assessed using the online software program Textalyser.

In addition, as research has stated that there is a high variability of teacher use of cognitively challenging utterances in the classroom, the researchers compared the change in performance across all four filming sessions for two teachers (Zucker et al., 2013). These two teachers were selected as one demonstrated the highest frequency of cognitively challenging utterances at pretest, and the other demonstrated the lowest frequency of cognitively challenging utterances at pretest. An analysis compared the rate of improvement in the usage of cognitively challenging utterances between these two teachers.

Results

Teacher Language Variables

Teacher language variables were examined in a 3 (Wave: posttests 1-3) x 3 (language code: word count, number of unique words, MLU) repeated measures multivariate analysis of variance (MANOVA); wave was the repeated measure (see Table 2). Significant main effects of wave, $F(2,8) = 6.72, p = .019$, partial $\eta^2 = .627$, and language code, $F(2,8) = 17.83, p = .001$, partial $\eta^2 = .817$ were obtained. These main effects were explained by a significant wave x language code interaction, $F(2,16) = 6.31, p = .003$, partial $\eta^2 = .612$ (see Table 2). Follow-up repeated measures analyses of variance (ANOVAs) were performed for each language code. Significant effects of wave were found for word count, $F(2,8) = 6.45, p = .022$, partial $\eta^2 = .617$, and number of unique words, $F(2,8) = 7.90, p = .013$, partial $\eta^2 = .664$. Follow-up Tukey's HSD tests indicated that both word count and the number of unique words spoken significantly decreased from the posttest 1 to posttest 2 (fall) ($ps < .05$), and although they improved from posttest 2 to posttest 3 (fall to spring), the improvement was not significant. An analysis of the MLU data across waves indicated no significant differences across wave.

Table 2

Teacher Language Codes at Posttest 1, 2, and 3 (N = 5)

Teacher Language Codes	Posttest 1		Posttest 2		Posttest 3	
	Mean	SD	Mean	SD	Mean	SD
Total Number Words	1264.40 ^a	634.42	601.60 ^b	379.65	1016.60 ^{ab}	609.73
Number Unique Words	342.80 ^a	133.27	204.20 ^b	91.45	284.60 ^{ab}	120.51
Mean Length Utterance	6.76 ^{ab}	1.19	6.99 ^{ab}	1.05	6.88 ^{ab}	0.63

Note: Across a row, values with different superscripts differ at $p < .05$.

Teacher Utterance Codes

Teacher utterance codes were examined in a 3 (Wave: posttests 1-3) x 3 (utterance codes: CCT, LCD, MI) repeated measures multivariate analysis of variance (MANOVA); wave was the repeated measure (see Table 3). A significant main effect of wave, $F(2,8) = 10.32$, $p = .006$, partial $\eta^2 = .721$ was obtained. Follow-up repeated measures analyses of variance (ANOVAs) were performed for each utterance code.

Table 3

Mean Teacher Utterances by Coding Categories at Posttest 1, 2, and 3 (N = 5)

Teacher Utterance Codes	Posttest 1		Posttest 2		Posttest 3	
	Mean	SD	Mean	SD	Mean	SD
CCT	70.00 ^a	41.76	40.00 ^b	32.12	60.60 ^{ab}	40.94
LCD	93.00 ^a	58.87	36.60 ^b	29.92	76.40 ^{ab}	56.51
MI	58.40 ^{ab}	37.82	32.20 ^{ab}	15.47	40.80 ^{ab}	18.65

Note: Across a row, values with different superscripts differ at $p < .05$.

A noticeable trend was found for CCT, $F(2,8) = 4.011$, $p = .062$, partial $\eta^2 = .501$, and a significant effect of wave was found for LCD, $F(2,8) = 4.754$, $p = .044$, partial $\eta^2 = .543$. Follow-up Tukey's HSD tests indicated that both CCT and LCD utterances significantly decreased from the posttest 1 to posttest2 (fall) ($ps < .05$), and although they increased from posttest 2 to posttest 3 (fall to spring), the improvement was not significant. An analysis of the MI data across waves indicated no significant differences across wave, $F(2,8) = 2.800$, $p = .120$.

Teacher Comparison Data

The performances of an initially high performing and an initially low performing teacher at pretest were compared by plotting change in frequency of cognitively

challenging talk across all four filming sessions (see Figure 2). The initially higher performing teacher made 63 cognitively challenging utterances during pretest filming, and the initially low performing teacher made only 16. These two teachers were selected for comparison as they were highest and lowest performing teachers at pretest, and they were present for all four filmings. After the first training session, the initially higher performing teacher increased her usage of cognitively challenging utterances by 79.4%. The initially lower performing teacher decreased her usage of cognitively challenging utterances at first posttest. Although both teachers decreased their usage of cognitively challenging utterances from first posttest to second posttest, the initially higher performing teacher's frequency was still 51.0% higher than her usage at pretest performance.

At the second posttest, the initially lower performing teacher uttered only 6 cognitively challenging utterances during the filming, which was lower than her pretest performance. At the final posttest, both teachers increased their usage of cognitively challenging utterances. The initially higher scoring teacher had 125 utterances, and the initially low scoring teacher had 33. Although both teachers increased their usage of cognitively challenging utterances from pretest to final posttest by approximately 50%, overall improvement was significantly higher for the initially higher scoring teacher, who increased from 63 to 125 utterances, compared to the initially lower scoring teacher, who increased from 16 to 33 utterances. This would suggest that it is possible that individuals who score higher in their usage of cognitively challenging utterances at pretest are more receptive to professional development training, and therefore demonstrate the Matthew Effect by showing a greater level of improvement (Penno et al., 2002).

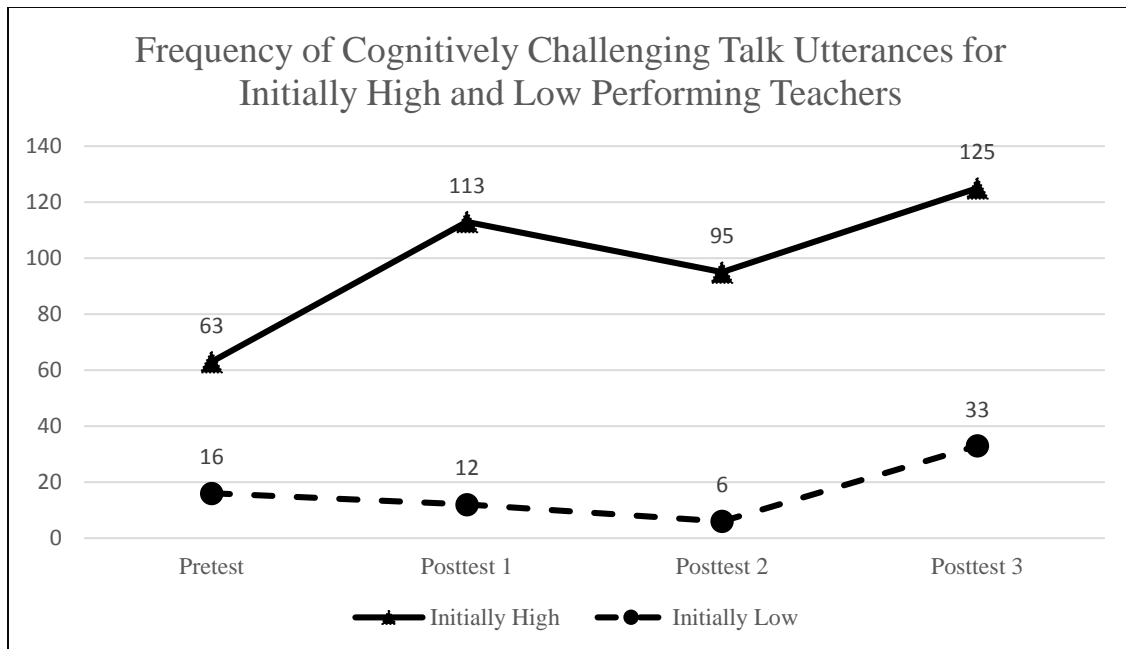


Figure 2. Frequency of Cognitively Challenging Talk Utterances for Initially High and Low Performing Teachers.

Discussion

The purpose of this study was to examine the long-term impact of a training program that was designed to increase the frequency of cognitively challenging utterances in preschool teachers during book reading. The study also examined the variability in teacher performance across all four filming sessions for the two teachers who had the highest and lowest frequencies of cognitively challenging utterances at pretest.

An examination of the teacher language variables indicated that there was an overall significant change across the three posttest filmings with moderate effect sizes. Follow-up analyses indicated that both word count and unique words spoken decreased significantly from the immediate posttest (1) to the posttest 2 (fall) film sessions. Fisher (2015) noted a significant improvement in word count and unique words spoken from the pretest to first posttest session. The significant decrease between posttests 1 and 2 found here supports the notion that these changes do not maintain over a longer period of time. While past studies have noted significant changes in the use of cognitively challenging utterances after training, research has not focused on the long-term impact of these training sessions until now (Dickinson and Smith, 1994). After a refresher training, improvements, although not significant, were noted in word count and unique words spoken. It is possible, given the period of time between the follow-up training and the spring film session (January to March), that teachers' word count and unique words spoken increased significantly after the training and began to decrease again, as this had occurred from posttest 1 to posttest 2. This idea of a significant improvement after a training is supported by the research of Milburn et al. (2014), who noted significantly

more words spoken and unique words spoken immediately following training. Future research should measure these variables at immediate after a follow-up training to test this possibility.

The frequency of CCT, LCD, and MI codes changed significantly across the three posttest filmings with a strong effect size. Follow-up post hoc tests indicated that CCT almost significantly and LCD significantly decreased from posttest 1 to posttest 2 (fall), and although both increased from posttests 2 to 3 (fall to spring), the change was not significant. The frequency of MI codes did not change across any of the filmings. Fisher (2015) noted a significant increase in CCT and LCD codes from the pretest to posttest filming. Like the teacher language variable data, a significant decrease from posttest 1 to posttest 2 (fall) occurred, and an improvement, though not significant, occurred from posttests 2 to 3 (fall to spring). It is possible that, like the teacher language variables, a significant increase in CCT and LCD utterances occurred after the follow-up training, but by the time the spring filming occurred, a decrease had occurred. This possibility is supported by the research of Fisher (2015), who found an immediate increase in CCT utterances after exposure training. In addition, the research of Dickinson and Smith (1994) supports this notion as they found an increase in these utterances following a training as well. Future research should measure these variables at multiple time points after a refresher training to test this possibility.

The comparison data between the initially high and initially low performing teachers at pretest demonstrated that although both teachers improved over time, the initially high performing teacher experienced a significant increase in the usage of CCT utterances after training compared to her low performing colleague. A possible

explanation of this would be the Matthew Effect, in that those that have a higher level of skill in this area show greater levels of improvement (Penno et al., 2002).

Strengths and Limitations

A few strengths of the study can be noted. First, teachers were provided instruction in group and individual settings. Teachers were provided a standard curriculum that emphasized considerations regarding book selection, preparing to read to children, promoting particular interactions during book reading, and promoting interactions after reading the book. Teachers were given the opportunity to practice those skills and receive feedback from the researchers and other teachers. In addition, during the first and second training, teachers were provided feedback regarding their previous filmed readings. This individual feedback helped teachers to understand how they could adjust their own extratextual talk during future readings. In addition, despite a small sample group used for the study, results yielded significant effect sizes. Finally, the degree of interrater reliability indicates that data collected from transcriptions of book readings were consistently recorded across multiple raters.

A few limitations of the study can be noted. First, there was low sample size of teachers utilized for this study. There would have been a greater likelihood for significant results had the researchers used a larger sample size that demonstrated similar changes in usage of cognitively challenging utterances across film sessions. The significant effect sizes support the idea that with a larger sample size, significance will be achieved. In the future, research studies could include a larger sample size. In addition, teachers were aware of when they were being filmed, which could have influenced their extratextual talk during the filming session. Also, although we can hypothesize that there

was a significant improvement in teacher language variables and cognitively complex talk immediately after the refresher training, a filming session did not occur until two months later. This leaves room for speculation regarding if the change from posttest 2 to posttest 3 would have been significant had the film sessions been more evenly spaced. In the future, the researchers should consider filming the book reading sessions more evenly. In addition, there was research to see if the changes in cognitively challenging utterances generalized. In the future, the researchers may want to utilize data such as CLASS scores to see if the changes in language generalized. Finally, because there was no control group, we cannot be certain that the changes in language variables and level of cognitive complexity were solely a result of the professional development training program.

Future Research

The findings of this study suggest a number of directions for future studies. Because this study focused on the changes in teacher language patterns, transcriptions of the filming sessions could be analyzed for changes in child language patterns. As the research supports that nature of teacher-child interactions influence child language performance, an analysis of child language patterns during the film sessions would establish whether the change in teacher utterances affected child utterances (Elley, 1989; Justice et al., 2005). In addition, studies could analyze if the changes in usage of cognitively challenging utterances persist longer than the few months that were analyzed for this study. Finally, research may focus on increasing the usage of cognitively challenging utterances in other areas of the classroom, such as free play. As the findings of the study support the notion that a professional development program can influence the

usage of cognitively challenging utterances during book reading, it is possible that this may apply to language patterns in other areas.

Conclusion

The research of Hart and Risley (2003) highlights the significance of language exposure in the first few years of life. As low-income students tend to experience less exposure to a varied vocabulary repertoire, schools must focus on exposing the child to language-based interactions that will mitigate the risk of future school failure. Although some teachers are capable of using utterances that are cognitively challenging, many teachers do not use them when interacting with children (Zucker et al., 2013).

Professional development programs that focus on improving these interactions between teachers and students have been shown to be effective. Past research has found that preschool environments characterized by a high frequency of cognitively challenging interactions have a direct impact on children with a high risk for future language difficulties and can potentially mitigate the risks for future school failure (Mashburn et al., 2008; Logan et al., 2011). This past research highlights the importance of using these utterances in the classroom. However, the changes in teacher cognitively challenging utterance usage as a result of these training programs generally disappear over time. The fading effects of these training programs over a long period of time calls for repeated and intensive follow-up trainings in order to ensure that teachers continue to use cognitively challenging utterances with students. Without training, research has noted that teachers typically provide few opportunities to interact with preschoolers in a manner that is cognitively beneficial to children (Turnbull et al., 2009). In addition, although teachers can improve their frequency of cognitively challenging utterances, programs must be

tailored in order address teachers of varying abilities at pretest. The comparison of the initially high- and low- performing teacher supports the notion that high-performing individuals improve more than the low-performing teachers after training. Programs tailored to low-performing teachers' needs may help these low-performing teachers improve their performance.

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APPENDIX A: Institutional Review Board Approval Document



INSTITUTIONAL REVIEW BOARD
OFFICE OF RESEARCH INTEGRITY

DATE: June 18, 2013

TO: Elizabeth Lemerise, Ph.D.
FROM: Western Kentucky University (WKU) IRB

PROJECT TITLE: [480761-1] Program Evaluation of Concept Development and Quality of Feedback Training for Preschool Teachers: Teacher Outcomes

REFERENCE #: IRB 13-400

SUBMISSION TYPE: New Project

ACTION: APPROVED

APPROVAL DATE: June 18, 2013

EXPIRATION DATE: June 18, 2014

REVIEW TYPE: Expedited Review

Thank you for your submission of New Project materials for this project. The Western Kentucky University (WKU) IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by a *signed* consent form. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

This project has been determined to be a Minimal Risk project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of June 18, 2014.

Please note that all research records must be retained for a minimum of three years after the completion of the project.

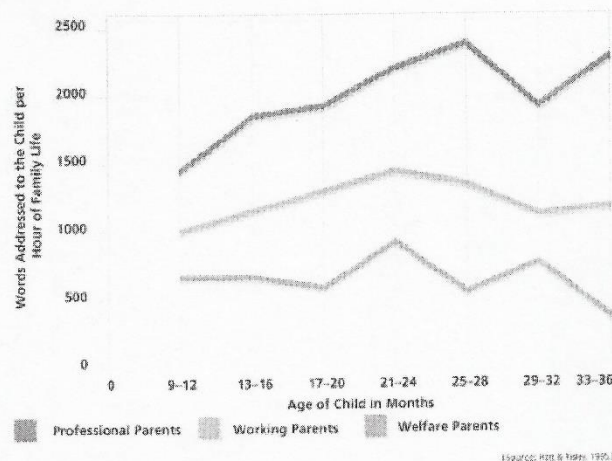
If you have any questions, please contact Paul Mooney at (270) 745-2129 or irb@wku.edu. Please include your project title and reference number in all correspondence with this committee.

APPENDIX B: Training PowerPoint Presentation

Poverty and Language Development

- Heard home language has profound implications for future cognitive success
- Hart and Todd Risley (1995) landmark study
 - Affluence of the parents = more speech to children.
 - Parents professionals spent almost twice as much time interacting
 - Children in families that received welfare assistance exposed to fewer words
 - Language used home differed among various types of families.
 - See Figure 7.12 for complete comparison

Figure 7.12



What do these findings suggest?

- Importance of early exposure to language
- Usefulness of intervention programs
- Consequences for children's general cognitive development and behavior related to poverty and family income

APPENDIX C: Training Handout

Some Tips on Book Reading

1. Book Selection

- a. There are lots of kinds of books!
- b. Consider your goals for teacher children—different kinds of books will help you meet different kinds of goals.
- c. Important things to consider in selecting a book
 - i. Introducing new vocabulary and ideas
 - ii. Vocabulary and ideas can be related to
 1. Child's experience
 2. Other lessons you have taught
 3. Other concepts that the child is familiar with
 - iii. Book type
 1. Does the book have a story?
 2. Or does the book have a format where each page provokes discussion?
 3. Book topic

2. Preparing to read to children

- a. First you must read the book and carefully study the pictures!
- b. Formulate a brief statement that introduces the book in a way that helps children to understand what the book is about and what to expect (scaffolding introduction).
- c. Think about some open-ended questions that be posed to the children to provoke discussion. Open-ended questions that can be posed to the children to provoke discussion. Open-ended questions have more than one possible answer.
 - i. What do you think will happen next?
 - ii. What does the picture tell you about...?
 - iii. How does "the character" feel about...?
 - iv. Why do you think that...?
 - v. How do you know that?

- vi. What would you do if you were the...?
- d. Identify vocabulary that will need definition and work on good explanations
- e. If the book is a bit long, think about some key places to summarize the story so far
- f. Formulate some thought provoking questions after the book
- 3. Reading the book
 - a. Be engaging! Use eye contact, animated facial expressions and vocal tone to engage children's attention.
 - b. Give children time to answer your questions
 - c. Repeat the child's answer, expanding on it: e.g., Assume you asked the children what their favorite thing in the book was:
 - i. Child: Shark!!!
 - ii. Teacher: You liked the shark the best. What did you like about that shark?
 - d. Manage children's behavior by praising the ones who are paying attention and/or behaving appropriately and complimenting children on their good questions and thinking
- 4. After the book
 - a. Ask children what they thought of the book and why
 - b. What are their favorite things about the book
 - c. You could share your favorite things too—it could provoke more discussion